

## CLAIMS

We claim:

1. An apparatus for crimping together multiple layers of tissue paper web comprising:  
5 a plurality of cross machine direction adjustable transverse carriages;  
an anvil roll mounted for rotation and extending in a cross machine direction;  
on each transverse carriage at least one crimping wheel mounted for rotation  
to a support bracket, the support bracket mounted by a linear bearing  
to the transverse carriage for vertical motion toward and away from  
10 the anvil roll; and  
at least one linear actuator extending between the transverse carriage and the  
support bracket on the transverse carriage, the linear actuator  
operable to move the support bracket and the crimping wheel  
mounted thereto into and out of engagement with the anvil roll.
- 15 2. The apparatus of claim 1 wherein the support bracket is mounted to a  
vertical carriage, and wherein the support bracket and the vertical carriage have  
portions which define a mating vertical groove and way to define the linear bearing.
3. The apparatus of claim 1 further comprising an air knife mounted to  
each transverse carriage to direct a stream of air against each crimping wheel.
- 20 4. The apparatus of claim 3 wherein the air knife further comprise a  
member positioned above an air duct forming part of the air knife, the member  
having a Coanda surface which directs air from the duct toward the at least one  
crimping wheel.

5. The apparatus of claim 1 further comprising:  
a first crimping wheel mounted for rotation on a first support bracket, the  
first support bracket being mounted by a first linear bearing to the  
transverse carriage for vertical motion toward and away from the  
anvil roll;  
5 wherein the at least one linear actuator comprises a first linear actuator  
extending between the transverse carriage and the first support  
bracket on the transverse carriage, the first linear actuator operable to  
move the first support bracket and the first crimping wheel mounted  
10 thereto into and out of engagement with the anvil roll;  
a second crimping wheel mounted for rotation on a second support bracket,  
the second support bracket mounted by a second linear bearing to the  
transverse carriage for vertical motion toward and away from the  
anvil roll, the first and second crimping wheel being mounted in  
15 spaced parallel relation; and  
wherein the at least one linear actuator further comprises a second linear  
actuator extending between the transverse carriage and the second  
support bracket on the transverse carriage, the second linear actuator  
operable to move the second support bracket and the second crimping  
20 wheel mounted thereto into and out of engagement with the anvil roll.

6. The apparatus of claim 5 wherein the first linear actuator is  
disconnectable from between the transverse carriage and the first support bracket,  
and when disconnected the first crimping wheel and the first support bracket are  
arranged to be slid upwardly on the first linear bearing to provide access to the first  
25 crimping wheel and the second crimping wheel.

7. The apparatus of claim 6 further comprising a locking mechanism  
which locks the first support bracket and the first crimping wheel in a raised position  
to the transverse carriage, the raised position providing access to the first crimping  
wheel and the second crimping wheel.

8. The apparatus of claim 6 further comprising a handle mounted to the first support bracket for positioning the transverse carriage, and for raising and lowering the first crimping wheel.

5 9. The apparatus of claim 5 wherein the first crimping wheel is mounted to a stub shaft which extends in a first direction from the first support bracket, and the second crimping wheel is mounted to a second stub shaft which extends from the second support bracket in a direction opposite the first direction, so that the first stub shaft and the second stub shaft extend towards each other.

10 10. The apparatus of claim 9 further comprising:  
a first guard mounted to the first bracket and extending radially outwardly  
from the first stub shaft and then extending axially to cover a portion  
of the first crimper peripheral edge; and  
a second guard mounted to the second bracket and extending radially  
outwardly from the second stub shaft and then extending axially to  
15 cover a portion of the second crimper peripheral edge.